

CLEAN VERSION OF AMENDED CLAIMS - OZ 0093/000032

- A1
3. The process as claimed in claim 1, wherein the nucleic acid sequence is derived from *Physcomitrella patens*.
  4. The process as claimed in claim 1, wherein the organism is an organism selected from the group consisting of bacterium, fungus, ciliate, algae, cyanobacterium, animal or plant.
  5. The process as claimed in claim 1, wherein the organism is a plant or algae.
  6. The process as claimed in claim 1, wherein the organism is an oil crops [sic].
  7. The process as claimed in claim 1, wherein the cultured organism contains at least 5% by weight of unsaturated fatty acids based on the total fatty acid content in the organism.
  8. The process as claimed in claim 1, wherein the unsaturated fatty acids are isolated from the organism.
- A2
11. An oil, lipid or fatty acid or a fraction thereof, prepared by the process as claimed in claim 1.
  12. The use of the oil, lipid or fatty acid composition as claimed in claim 11 or of a transgenic organism in feed, foodstuffs, cosmetics or pharmaceuticals.

**MARKED UP VERSION OF AMENDED CLAIMS - OZ 0093/00032**

3. The process as claimed in claim 1 [or 2], wherein the nucleic acid sequence is derived from *Physcomitrella patens*.
4. The process as claimed in claim 1 [any of claims 1 to 3], wherein the organism is an organism selected from the group consisting of bacterium, fungus, ciliate, algae, cyanobacterium, animal or plant.
5. The process as claimed in claim 1 [any of claims 1 to 4], wherein the organism is a plant or algae.
6. The process as claimed in claim 1 [any of claims 1 to 5], wherein the organism is an oil crops [sic].
7. The process as claimed in claim 1 [any of claims 1 to 6], wherein the cultured organism contains at least 5% by weight of unsaturated fatty acids based on the total fatty acid content in the organism.
8. The process as claimed in claim 1 [any of claims 1 to 7], wherein the unsaturated fatty acids are isolated from the organism.
11. An oil, lipid or fatty acid or a fraction thereof, prepared by the process as claimed in claim 1 [any of claims 1 to 8].
12. The use of the oil, lipid or fatty acid composition as claimed in claim 11 or of a transgenic organism [as claimed in claim 9] in feed, foodstuffs, cosmetics or pharmaceuticals.

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1. A process of preparing unsaturated fatty acids, which comprises introducing, into an organism, at least one isolated nucleic acid sequence encoding a polypeptide having Δ6-desaturase activity, selected from the group consisting of:
  - a) a nucleic acid sequence having the sequence shown in SEQ ID NO: 1,
  - b) nucleic acid sequences which, as a result of the degeneracy of the genetic code, are derived from the [lacuna] in SEQ ID NO: 1,
  - c) derivatives of the nucleic acid sequence shown in SEQ ID NO: 1 which encode polypeptides with the amino acid sequences shown in SEQ ID NO: 2 and have at least 50% homology at the amino acid level without substantially reducing the enzymatic action of the polypeptides,  
and culturing this organism, where the cultured organism contains at least 1 mol% of unsaturated fatty acids based on the total fatty acid content in the organism.
2. The process as claimed in claim 1, wherein the nucleic acid sequence is derived from a plant or algae.
3. The process as claimed in claim 1, wherein the nucleic acid sequence is derived from *Physcomitrella patens*.
4. The process as claimed in claim 1, wherein the organism is an organism selected from the group consisting of bacterium, fungus, ciliate, algae, cyanobacterium, animal or plant.
5. The process as claimed in claim 1, wherein the organism is a plant or algae.

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6. The process as claimed in claim 1, wherein the organism is an oil crops [sic].
7. The process as claimed in claim 1, wherein the cultured organism contains at least 5% by weight of unsaturated fatty acids based on the total fatty acid content in the organism.
8. The process as claimed in claim 1, wherein the unsaturated fatty acids are isolated from the organism.
9. A transgenic organism selected from the group consisting of plants, fungi, ciliates, algae, bacteria, cyanobacteria or animals comprising at least one isolated nucleic acid sequence encoding a polypeptide with  $\Delta 6$ -desaturase activity, selected from the group consisting of:
- a nucleic acid sequence having the sequence shown in SEQ ID NO: 1,
  - nucleic acid sequences which, as a result of the degeneracy of the genetic code, are derived from the [lacuna] in SEQ ID NO: 1,
  - derivatives of the nucleic acid sequence shown in SEQ ID NO: 1 which encode polypeptides with the amino acid sequences shown in SEQ ID NO: 2 and have at least 50% homology at the amino acid level without substantially reducing the enzymatic action of the polypeptides.
10. A transgenic organism as claimed in claim 9, wherein the organism is a plant or algae.
11. An oil, lipid or fatty acid or a fraction thereof, prepared by the process as claimed in claim 1.

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12. The use of the oil, lipid or fatty acid composition as claimed in claim 11 or of a transgenic organism in feed, foodstuffs, cosmetics or pharmaceuticals.